

Fabrication-Fabricating of a new electrochemical modified graphite pencil electrode based on acetophenone (2,4-dinitrophenyl)hydrazone for determination-determining of selenium in food and water samples

<https://pubs.rsc.org/en/content/articlelanding/2018/ay/c8ay01959b/unauth#!divAbs>
tract

Abstract

In this new report, we ~~demonstrate deal with~~ the electrochemical determination and analysis of selenium at the surface of a graphite pencil electrode ~~which is~~ modified with a sensing composite film, composed of acetophenone (2,4-dinitrophenyl) hydrazone, polypyrrole, and copper nano particles. The electrochemical response of the fabricated modified electrode ~~toward to~~ selenium was evaluated using cyclic and square wave voltammetry techniques. The modified electrode presented an excellent electro-catalytic effect with ~~the~~ favorable electrochemical parameters ($\alpha = 0.24$, $\log K_s = 3.27 \text{ s}^{-1}$, and $\Gamma = 3.74 \times 10^{-7} \text{ mmol cm}^{-2}$) for reduction of selenium in ~~the~~ acidic media with the optimized pH of 2 and at the working potential of -0.75 V (vs. SCE). The scanning electron microscopy images of the modified surfaces ~~emphasized~~ **proved** the formation of the aggregates **involving the particles fall in the nano-scales**, indicating ~~the~~ successful electrodeposition and electropolymerization processes to modify ~~a~~ ~~the~~ graphite pencil surface. Owing to the features of the fabricated sensor, it revealed a linear electrochemical response toward selenium within the concentration range of 50 nM to 110 nM with the limits of detection (LOD) of 16.58 nM. The analytical application of the new sensor was also examined with its applicability in food samples such as milk sample ~~and as well as~~ water samples ~~such as including~~ food waste water samples, ~~displaying-It suggested the~~ valid determination of selenium without any side interferences.

Key Words: Selenium, Square wave voltammetry, Modified electrode, acetophenone (2,4-dinitrophenyl)hydrazone , Cyclic voltammetry.

Formatted: Highlight

Commented [A1]: یعنی چی که به خاطر ویژگی های فلان از خودش پاسخ الکتروشیمیایی نشان داد؟! آن ویژگی ها چیستند؟